Safety and Use of Complementary and Alternative Medicine in Norway During the First Wave of the COVID-19 Pandemic Using an Adapted Version of the I-CAM-Q: A Cross-Sectional Survey

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Abstract

Background

The COVID-19 pandemic lockdown has had a profound impact on physical and mental well-being throughout the world. Previous studies have revealed that complementary and alternative medicine (CAM) is frequently used for, and can be potential beneficial for strengthening physical mental resilience. The aim of this study was therefore to determine the prevalence, associations and reasons for use of CAM during the first wave of the COVID-19 pandemic among a representative sample of the Norwegian population, and determine possible effects and adverse effects of the treatments.

Methods

Computer assisted telephone interviews using a COVID-adapted I-CAM-Q questionnaire were conducted with 1008 randomly selected Norwegians aged 16 and above using multistage sampling during April and May 2020 applying age and sex quotas for each area. Descriptive statistics were carried out using Pearson's Chi-square test, Fisher exact test, and Independent samples T-tests to identify group differences.

Results

The study revealed that two thirds of the respondents (67%) had used CAM within the first three months of the COVID-19 pandemic, in particular CAM modalities that did not involve a provider. Most used were natural remedies and dietary supplement (57%, mainly vitamins and minerals), but self-help practices like yoga and meditation were also widely used (24%). Women used CAM modalities significantly more than men (77% vs. 58%). Most of the respondents found the modalities they used beneficial, and 5% reported adverse effects of the treatments.

Conclusions

The first wave of the COVID-19 pandemic has not profoundly changed the overall need of Norwegian citizens to seek care outside the conventional healthcare system, but rather caused a shift in the type of CAM modalities used. The risk profile of these modalities was generally low as only 5 % of the respondents reported adverse effects. Further studies are needed to confirm the change from provider based to self-administered CAM use.

Background

The COVID-19 pandemic lockdown has a profound impact on physical and mental well-being throughout the world [1]. In Norway, a nationwide lockdown was implemented on March 12, 2020 [4]. Kindergarten, schools, and universities were closed and employees who could work from home were instructed to do so. Although a lockdown most likely decreased the spread and harm from COVID-19 [2], studies describe that such restrictions might have serious mental health effects on the population [5–8], in particular in

groups that already were vulnerable [9]. While the COVID-19 pandemic has led to increased activity for parts of health care, other parts were significantly reduced: Consultations and operations have been postponed due to infection control and health care providers in quarantine [3], and referral to a wide range of mental health services has decreased [1]. Health care providers working outside established health care services were instructed to close down their clinics and stop offering treatments that included physical contact between provider and client. This led to a lockdown among many complementary and alternative medicine (CAM) providers or reorganisation of their practice to telephone- and video consultations [4] where that could be of help to their clients.

CAM is defined as a group of diverse medical and health care practices and products that are not generally considered part of conventional medicine [5]. Several subcategories of health care-seeking behaviour fall under the definition of CAM: Visits to CAM providers; use of natural remedies and dietary supplements; and different types of self-help practices [6]. CAM is widely used, ranging from 10% [7] to 76% worldwide [8]. CAM is also commonly used in Europe [7], and Scandinavia [9, 10]. In Norway a recently published study demonstrated that 62.2% of the respondents reported to have used CAM within a 12 months period [11]. Most respondents had used natural remedies and dietary supplements (47.7%), followed by self-help practices such as yoga and meditation (29.1%), and consultations with CAM providers (14.7%)[11].

A previous literature review described that CAM is frequently used to strengthen physical and mental resilience, and describe a possibly direct effect of CAM approaches like vitamin A, D, and mind-body interventions on immune functions and influenza, relevant for people during the COVID-19 pandemic [12]. However, it is not known whether people in Norway are making use of CAM to deal with possible negative health effects of the COVID-19 related restrictions such as weight gain [21], depression, anxieties, economic pressure, and mental illness [22]. Furthermore, people access to CAM might have been limited as the CAM providers had to close down their practice during the lockdown the first three months of the pandemic.

The aim of this study was therefore to determine the prevalence, associations, and reasons for use of CAM during the first wave of the COVID-19 pandemic among a representative sample of the Norwegian population, and further determine possible effects and adverse effects of the modalities.

Methods

In Norway, a national cross-sectional survey was carried out between April 28 and May 5 2020 using computer-assisted telephone interviews. The survey was conducted in collaboration with the marketing research company Ipsos A/S and had a target sample of 1000 people, representing the Norwegian population of 5.4 million inhabitants [13]. The sample was stratified by sex, age and region of residence and drawn from Norwegian residents aged 16 and above living in private households with a landline telephone or a cell phone using random quota sampling. Up to 7 attempts were made to reach the selected person. N=4,337 were unreachable after 7 calling attempts (figure 1). Individuals who were

reached and refused participation (n=1,881) were considered non-respondents, leading to a response rate of 34.5%. The final sample contained 1008 individuals, 487 women and 521 men (figure 1).

Survey instrument

A COVID-19 adapted version of the International Questionnaire to Measure Use of Complementary and Alternative Medicine (I-CAM-Q) was used [11, 14] addressing COVID-19 related use in addition to use for acute illness, chronic illness, well-being and other, unspecified reasons. The survey consisted of three parts: The first part related to CAM use offered by CAM providers, the second part included questions regarding use of natural remedies and dietary supplements while the third part included questions related to self-help practices such as mindfulness, yoga, and relaxation techniques. In all parts, the questions referred to use during the last three months. Demographic characteristics collected were sex, age, level of education, household income and place of residence. All data were anonymously collected and reported.

Measures

Measures of personal characteristics

Age was obtained as an open question and assessed as a continuous variable as well as categorical after being divided into four groups; 16-24 years; 25-39; 40-59 years; and 60 year or more.

Level of education was collected using six categories: 1. Primary school up to 8 years; 2. primary school up to 10 years; 3. secondary school; 4. college/university less than 4 years; and 5. college/university 4 years or more. These were merged into primary school (1-2); secondary school (3); and college/university (4-5).

Household income was collected using the following categories (NOK <100,000, 100,000-199,000, 200,000-299,000, 300,000-399,000, 400,000-499,000, 500,000-599,000, 600,000-799,000, 800,000-999,000, 1000,000-1500,000 and more than NOK 1500,000). These categories were merged into low household income (<NOK400,000), middle household income (NOK 400,000-799,000) and high household income (NOK 800,000 or more).

Other personal characteristics included sex (female, male) and residence (merged into the Norwegian regions South-East, South, West, Mid (Trøndelag), and North).

CAM providers

The measure consultations with *CAM providers* were specified by visits to massage therapists, naprapaths, acupuncturists, coaches, healers, homeopaths, cupping therapists, herbalists, traditional healers, osteopaths, kinesiologists, and other CAM providers.

The respondents were asked whether they had consulted one or more CAM providers and if yes; reasons, benefit, and possible adverse effects of the treatments.

Natural remedies and dietary supplements

Use of natural remedies and dietary supplements were mapped by providing the respondents with a list of remedies organized as *herbs* (ginger, curcumin, garlic, green tea, herbal tea, cranberry, blueberry/blueberry extract, oregano, echinacea, chaga, and other), *vitamins and minerals* (vitamin B, vitamin C, vitamin D, magnesium, calcium, iron, zinc, selenium, and other vitamins and minerals), *homeopathic remedies*, *Bach flower remedies*, and *dietary supplements* (Omega 3, 6 or 9, protein shake, Q10, and other dietary supplements). The respondents were asked whether they had used one or more of these remedies, and if yes; reasons, benefit, and possible adverse effects of this use.

Self-help practices

Use of self-help practices were measured by specific questions regarding the use of meditation, yoga, qigong, tai chi, relaxation, visualization, mindfulness, lightning process, neuro-linguistic programming (NLP), participation in traditional healing rituals, and other self-help practices. The respondents were asked *if* they had used these self-help practices and further; why, whether they found it to be beneficial, and if they experienced adverse effects.

Over-all use of CAM

Over-all-CAM use was measured by calculating the total number of CAM users reported, combining the variables *modalities provided by CAM providers*, *natural remedies and dietary supplements*, and *self-help practices*.

Statistics

Descriptive statistics were carried out using Statistical Package for Social Sciences (SPSS) v. 26.0. Pearson's chi-square tests, Fisher exact tests, and T-test were performed to identify differences in sociodemographic factors (age, education level, household income) between men and women and between CAM users and non-CAM users.

Results

Basic characteristics of the respondents

The survey consisted of slightly more men than women (51.7% vs 48.3%), with a mean age of 44.95 and 48.03 years respectively ($p=0.009$). The majority of respondents had high income (41.7%), a college or

university education (53.5%) and were living in the South-Eastern part of Norway (50.7%). The men had higher income ($p= 0.017$) and lower education ($p=0.002$) compared to women (table 1).

Table 1. Basic characteristics of the respondents

	Total		Women		Men		
	%	(n=1008)	%	(n=487)	%	(n=521)	p-value
Gender							
Men	51.7	(521)					
Women	48.3	(487)					
Age							
Mean age (years)	46.44	(1008)	48.03		44.95		0.009 ²
(SD)	(18.678)		(18.959)		(18.305)		
18-24 years	15.9	(160)	14.8	(72)	16.9	(88)	0.059 ¹
25-39 years	25.1	(253)	22.0	(107)	28.0	(146)	
40-59	32.7	(330)	34.4	(168)	31.1	(162)	
≥ 60 years	26.3	(265)	28.7	(140)	24.0	(125)	
Household income³							0.017 ¹
Low	10.5	(106)	11.5	(56)	9.6	(50)	
Middle	26.8	(270)	25.5	(124)	28.0	(146)	
High	41.7	(420)	38.4	(187)	44.7	(233)	
Do not want to answer	6.2	(62)	6.2	(30)	6.1	(32)	
Do not know	14.9	(150)	18.5	(90)	11.5	(60)	
Years of Education							0.002 ¹
Primary school	11.0	(111)	11.1	(54)	10.9	(57)	
Secondary school	35.5	(358)	30.2	(147)	40.5	(211)	
College/university	53.5	(539)	58.7	(286)	48.6	(253)	
Region of residence							0.929 ¹
South-East	50.7	(511)	51.1	(249)	50.3	(262)	
South	5.7	(57)	5.3	(26)	6.0	(31)	
West	25.3	(255)	26.1	(127)	24.6	(128)	
Mid (Trøndelag)	8.7	(88)	8.4	(41)	9.0	(47)	
North	9.6	(97)	9.0	(44)	10.2	(53)	

¹Pearson chi-square test; ²Independent samples t-test; ³ Low (<NOK400,000), middle (NOK 400,000-799,000), and high ($\geq$ NOK 800,000).

CAM use

A total of 67.2% of the respondents had used CAM during the first three months of the COVID-19 pandemic, more women (77.4%) than men (57.6%, $p<0.001$, table 2). Less than 8% of the survey respondents had consulted CAM providers (table 2). Most frequently used were natural remedies and dietary supplements (57%), followed by self-help practises (24.2%).

Table 2. Use of CAM among female and male respondents during the first three months of the COVID-19 pandemic

	Total % (n)	Women % (n)	Men % (n)	p-value
Consultations with CAM providers	7.8 (79)	10.1 (49)	5.5 (30)	0.011 ¹
Use of natural remedies and dietary supplements	57.0 (575)	66.7 (325)	48.0 (250)	<0.001 ¹
Herbs	14.9 (150)	19.1 (93)	10.9 (57)	<0.001 ¹
Vitamins and minerals ³	43.1 (434)	52.4 (255)	34.4 (179)	<0.001 ¹
Homeopathic remedies	1.3 (13)	1.0 (5)	1.5 (8)	0.474 ¹
Bach flower remedies	0.4 (4)	0.8 (4)	0.0 (0)	0.054 ²
Other dietary supplements	23.7 (239)	26.5 (129)	21.1 (110)	0.045 ¹
Use of self-help practices (yoga, meditation etc.)	24.2 (244)	32.4 (158)	16.5 (86)	<0.001 ¹
Total use of CAM (providers, supplements or self-help)	67.2 (677)	77.4 (4)	57.6 (300)	<0.001 ¹

1 Pearson Chi-Square test; 2 Fisher exact test; ³Vitamins and minerals other than multi-vitamin tablets/mixture

Consultation with CAM providers

CAM providers were consulted by 7.8% of the respondents, 10.1% of the women and 5.5% of the men ($p=0.011$) during the first three months of the COVID-19 pandemic (table 2). Massage therapists (3%), naprapaths (1.5%), psychotherapists (1.4%), acupuncturists (1.2%), and reflexologists (1%) were the most visited CAM providers. Most of the respondents experienced positive effect of the treatments, ranging from 91.7% (acupuncturist) to 100% (naprapaths, psychotherapists, and reflexologists) mainly for chronic complaints. One had consulted a traditional healer for preventing COVID-19. Men and women consulted CAM providers to a similar degree except for massage therapists who were more frequently visited by women (4.1%) compared to men (1.9%, $p=0.041$, table 3).

The respondents who had consulted CAM providers were mainly middle aged, with secondary education or lower university education, high income, and living in the South-Eastern part of Norway. They did not differ from respondents *not* consulting CAM providers in regard to these factors (table 4, $p>0.217$). Similar characteristics were found for both women and men apart from educational level were the women who consulted CAM providers were more likely to have college or university education (61.2%)

compared to men (23.3%, $p=0.001$, table 5). Men consulting CAM providers differed in this regard from men who did not where 50.1% reported to have college or university education ($p=0.007$). Women, on the other hand had similar education as those who did not consult CAM providers ($p=0.931$).

Table 3. The most commonly used CAM modalities during the first three months of the COVID-19 pandemic, reason for use and self-perceived benefit

	Total % (n)	Women % (n)	Men % (n)	p-value	Reason for use ³				Other % (n)	Very or somewhat beneficial % (n)
					Acute illness % (n)	Long-term illness % (n)	Improvement of wellbeing % (n)	Prevent/treat COVID-19 % (n)		
Consultations with CAM providers										
Massage therapists	3.0 (30)	4.1 (20)	1.9 (10)	0.041 ¹	0	40.0 (12)	36.7 (11)	0	23.3 (7)	98.3 (28)
Naprapaths	1.5 (15)	1.6 (8)	1.3 (7)	0.695 ¹	13.3 (2)	73.3 (11)	0	0	13.3 (2)	100 (15)
Psychotherapists	1.4 (14)	1.4 (7)	1.3 (7)	0.899 ¹	7.1 (1)	64.3 (9)	21.4 (3)	0	7.1 (1)	100 (14)
Acupuncturists	1.2 (12)	1.2 (6)	1.2 (6)	0.906 ¹	16.7 (2)	50.0 (6)	8.3 (1)	0	25.0 (3)	91.7 (11)
Reflexologists	1.0 (10)	0.8 (4)	1.2 (6)	0.754 ²	10.0 (1)	50.0 (5)	30.0 (3)	0	10.0 (1)	100 (10)
Use of natural remedies and dietary supplements										
Vitamin D	22.6 (228)	29.4 (143)	16.3 (85)	<0.001 ¹	3.5 (8)	21.5 (49)	32.9 (75)	1.8 (4)	45.2 (103)	72.4 (165)
Omega 3, 6 or 9	18.8 (190)	21.8 (106)	16.1 (84)	0.022 ¹	0.5 (1)	10.0 (19)	48.4 (92)	2.1 (4)	44.7 (85)	62.6 (119)
Vitamin C	16.5 (166)	18.7 (91)	14.4 (75)	0.066 ¹	12.0 (20)	5.4 (9)	38.6 (64)	5.4 (9)	44.6 (74)	64.4 (107)
Magnesium	10.8 (109)	14.6 (71)	7.3 (38)	<0.001 ¹	0	31.2 (34)	23.9 (26)	2.8 (3)	41.3 (45)	75.2 (82)
Iron	5.5 (55)	8.8 (43)	2.3 (12)	<0.001 ¹	5.5 (3)	23.6 (13)	32.7 (18)	1.8 (1)	43.6 (24)	90.9 (50)
Calcium	5.5 (55)	8.2 (40)	2.9 (15)	<0.001 ¹	0	45.5 (25)	27.3 (15)	3.6 (2)	27.3 (15)	67.3 (37)
Ginger	5.0 (50)	5.7 (28)	4.2 (22)	0.265 ¹	12.0 (6)	14.0 (7)	34.0 (17)	4.0 (2)	48.0 (24)	74.0 (37)
Herbal tea	4.2 (42)	6.0 (29)	2.5 (13)	0.006 ¹	7.1 (3)	11.9 (5)	52.4 (22)	2.4 (1)	28.6 (12)	64.3 (27)
Garlic	4.0 (40)	4.3 (21)	3.5 (19)	0.589 ¹	12.5 (5)	7.5 (3)	27.5 (11)	5.0 (2)	60.0 (24)	67.5 (27)
Green tea	3.9 (39)	4.7 (23)	3.1 (16)	0.174 ¹	0	5.1 (2)	66.7 (26)	2.6 (1)	33.3 (13)	56.4 (24)
Self-help practices										
Yoga	13.2 (133)	20.5 (100)	6.3 (33)	<0.001 ¹	2.3 (3)	13.5 (18)	54.9 (73)	0	36.8 (49)	93.3 (83)
Meditation/Mindfulness	10.9 (110)	14.0 (68)	8.1 (42)	0.003 ¹	2.7 (3)	15.5 (17)	67.3 (74)	1.8 (2)	29.1 (32)	93.8 (103)
Relaxation	7.8 (79)	11.9 (58)	4.0 (21)	<0.001 ¹	6.3 (5)	29.1 (23)	55.7 (44)	0	19.0 (15)	98.7 (78)
Visualisation	3.3 (33)	4.3 (21)	2.3 (12)	0.073 ¹	6.1 (2)	12.1 (4)	54.5 (18)	0	39.4 (13)	97.0 (32)

¹ Pearson Chi-Square test; ² Fisher exact test; ³ Multiple choices possible so total sum might exceed 100%

Natural remedies and dietary supplements

More than half of the respondents (57%) had used natural remedies and dietary supplements during the first three months of the COVID-19 pandemic (table 2), mostly reported to be beneficial, ranging from 56.4% (green tea) to 90.9% (iron). Natural remedies and dietary supplements were mainly used for well-being or other reasons, only 1.5% ($n=15$) used natural remedies and dietary supplements to treat or prevent COVID-19; vitamin C ($n=9$), vitamin D ($n=4$), Omega 3, 6 or 9 fatty acid ($n=4$), and magnesium ($n=3$). Vitamin D (22.6%), Omega 3.6 or 9 (18.8%), vitamin C (16.5%), magnesium (10.8%), iron (5.5%), calcium (5.5%), ginger (5.0%), herbal tea (4.2%), garlic (4.0%), and green tea (3.9%) were most used (table 3). Vitamin D, omega 3, 6, and 9, magnesium, iron, calcium, and herbal tea were most frequently used by women ($p<0.023$, table 3). Women used significantly more natural remedies and dietary supplements compared to men (66.7% vs. 48.0%, $p<0.001$). Besides from being female, the users of natural remedies and dietary supplements were older than the non-users (47.5 years vs. 45.0 years, $p=0.035$), and with

higher age among the female users (48.8 compared to 45.8 years among male users, $p=0.063$). Education and household income were similar among users and non-users of natural remedies and dietary supplements (table 4, $p>0.067$), but women were more likely to have college or university education compared to the male users of natural remedies and dietary supplements (60.3% vs 45.0%, $p=0.001$, table 5). Neither women nor men differed from the non-users of natural remedies and dietary supplements in regard to education.

Self-help practices

Self-help practices were used by 24.2% ($n=244$) of the respondents during the first three months of the COVID-19 pandemic, the majority with positive effect ranging from 93.3% (yoga) to 98.7% (relaxation). The self-help practices were mainly used to improve well-being, only 3 (2 meditation/mindfulness and 1 Qigong) had used this to prevent or treat COVID-19. Twice as many women (32.4%) than men used self-help practices (16.5%, $p<0.001$, table 2). The most frequently used self-help practice among women was yoga (20.5%), while meditation/mindfulness (8.1%) were the most used self-help practice among men (table 3). The respondents practicing self-help practices were younger, and more likely to have a college/university education compared to those who did not partake in such practices (table 4). Women reporting self-help practices were more likely to have university education (69% vs. 53.8%, $p=0.003$) than women who did not. Men also, but not at a significant level (51.2% vs. 48%, $p=0.793$).

Table 4. Associations for use of CAM during the first three months of the COVID-19 pandemic

	CAM providers			Natural remedies and dietary supplementst			Self-help practices			Use of any CAM modality		
	Yes % (n)	No % (n)	p-value	Yes % (n)	No % (n)	p-value	Yes % (n)	No % (n)	p-value	Yes % (n)	No % (n)	p-value
Sex			0.011 ¹			<0.001 ¹			<0.001 ¹			<0.001 ¹
Female	62.0 (49)	47.1 (348)		56.5 (325)	37.4 (162)		64.8 (158)	43.1 (329)		55.7 (377)	33.2 (110)	
Male	38.0 (30)	52.9 (491)		43.5 (250)	62.6 (271)		35.2 (86)	56.9 (435)		44.3 (300)	66.8 (221)	
Age (years)			0.302 ¹			0.068 ¹			<0.001 ¹			0.324
16-24	8.9 (7)	16.5 (153)		15.8 (91)	15.9 (69)		20.9 (51)	14.3 (109)		16.5 (112)	14.5 (48)	
25-39	29.23 (23)	24.8 (230)		23.5 (135)	27.3 (118)		32.8 (80)	22.6 (173)		25.4 (172)	24.5 (81)	
40-59	36.7 (29)	32.4 (301)		31.3 (180)	34.6 (150)		34.0 (83)	32.3 (247)		30.9 (209)	36.6 (121)	
60+	25.3 (20)	26.4 (245)		29.4 (169)	22.2 (96)		12.3 (30)	30.8 (235)		27.2 (184)	24.5 (81)	
Education			0.218 ¹			0.652 ¹			0.001 ¹			0.179
Primary/Secondary	53.2 (42)	46.0 (427)		45.9 (264)	47.3 (205)		37.3 (91)	49.5 (378)		45.1 (305)	49.5 (164)	
College/University	46.8 (37)	54.0 (502)		54.1 (311)	52.7 (228)		62.7 (153)	50.5 (386)		54.9 (372)	50.5 (167)	
Household income			0.726 ¹			0.132 ¹			0.489 ¹			0.249
Low	15.9 (10)	13.1 (96)		15.3 (70)	10.7 (36)		15.7 (31)	12.5 (75)		14.7 (79)	10.4 (27)	
Middel	30.2 (19)	34.2 (251)		34.1 (156)	33.7 (114)		31.8 (63)	34.6 (207)		33.3 (179)	35.1 (91)	
High	54.0 (34)	52.7 (386)		50.7 (232)	55.6 (188)		52.5 (104)	52.8 (316)		52.0 (279)	54.4 (141)	
Region of residence			0.556 ²			0.563 ¹			0.157 ¹			0.518
East	58.2 (46)	50.1 (465)		51.5 (296)	49.7 (215)		54.5 (133)	49.5 (378)		52.1 (353)	47.7 (158)	
South	2.5 (2)	5.9 (55)		5.2 (30)	6.2 (27)		4.5 (11)	6.0 (46)		5.0 (34)	6.9 (23)	
West	20.3 (16)	25.7 (239)		26.4 (152)	23.8 (103)		20.1 (49)	27.0 (206)		25.3 (171)	25.4 (84)	
Mid (Trondelag)	8.9 (7)	8.7 (81)		8.2 (47)	9.5 (41)		10.7 (26)	8.1 (62)		8.1 (55)	10.0 (33)	
North	10.1 (8)	9.6 (89)		8.7 (50)	10.9 (47)		10.2 (25)	9.4 (72)		9.5 (64)	10.0 (33)	

¹ Pearson chi-square test; ² Fisher exact test

Table 5. Gender differences in associations for use of CAM during the first three months of the COVID-19

	CAM providers				Natural remedies and dietary supplements				Self-help practices				Total use of CAM			
	Total	Women % (n)	Men % (n)	p-value	Total	Women % (n)	Men % (n)	p-value	Total	Women % (n)	Men % (n)	p-value	Total	Women % (n)	Men % (n)	p-value
Age (years)				0.650 ²				0.152 ¹				0.010 ¹				0.103 ¹
16-24	8.9 (7)	8.2 (4)	10.0 (3)		15.8 (91)	13.8 (45)	18.4 (46)		20.9 (51)	19.0 (30)	24.4 (21)		16.5 (112)	15.1 (57)	18.3 (55)	
25-39	29.23 (23)	24.5 (12)	36.7 (11)		23.5 (135)	21.5 (70)	26.0 (65)		32.8 (80)	27.8 (44)	41.9 (36)		25.4 (172)	22.8 (86)	28.7 (86)	
40-59	36.7 (29)	40.8 (20)	30.0 (9)		31.3 (180)	34.2 (111)	27.6 (69)		34.0 (83)	36.7 (58)	29.1 (25)		30.9 (209)	34.0 (128)	27.0 (81)	
60+	25.3 (20)	26.5 (13)	23.3 (7)		29.4 (169)	30.5 (99)	28.0 (70)		12.3 (30)	16.5 (26)	4.7 (4)		27.2 (184)	28.1 (106)	26.0 (78)	
Education				0.001 ¹				0.001 ¹				0.006 ²				<0.001 ¹
Primary/Secundar	53.2 (42)	38.8 (19)	76.7 (23)		45.9 (264)	39.7 (129)	54.0 (135)		49.5 (378)	46.2 (152)	52.0 (226)		45.1 (305)	38.5 (145)	53.3 (160)	
College/University	46.8 (37)	61.2 (30)	23.3 (27)		54.1 (311)	60.3 (196)	46.0 (115)		50.5 (386)	53.8 (177)	48.0 (209)		54.9 (372)	61.5 (232)	46.7 (140)	
Household income				0.342 ²				0.703 ¹				0.416 ¹				0.587 ¹
Low	15.9 (10)	20.0 (8)	8.7 (2)		15.3 (70)	16.5 (41)	13.9 (29)		15.7 (31)	18.0 (24)	10.8 (7)		14.7 (79)	16.2 (47)	13.0 (32)	
Middel	30.2 (19)	25.0 (10)	39.1 (9)		34.1 (156)	32.9 (82)	35.4 (74)		31.8 (63)	30.8 (41)	33.8 (22)		33.3 (179)	33.0 (96)	33.7 (83)	
High	54.0 (34)	55.0 (22)	52.2 (12)		50.7 (232)	50.6 (126)	50.7 (106)		52.5 (104)	51.1 (68)	55.4 (36)		52.0 (279)	50.9 (148)	53.3 (131)	
Region of residence				0.213 ²				0.614 ¹				0.365 ²				0.477 ¹
East	58.2 (46)	63.3 (31)	50.0 (15)		51.5 (296)	52.0 (169)	50.8 (127)		54.5 (133)	57.0 (90)	50.0 (43)		52.1 (363)	53.3 (201)	50.7 (152)	
South	2.5 (2)	2.0 (1)	3.3 (1)		5.2 (30)	4.0 (13)	6.8 (17)		4.5 (11)	2.5 (4)	8.1 (7)		5.0 (34)	3.7 (14)	6.7 (20)	
West	20.3 (16)	20.4 (10)	20.0 (6)		26.4 (152)	27.4 (89)	25.2 (63)		20.1 (49)	19.6 (31)	20.9 (18)		25.3 (171)	26.0 (98)	24.3 (73)	
Mid (Trondelag)	8.9 (7)	10.2 (5)	6.7 (2)		8.2 (47)	7.7 (25)	8.8 (22)		10.7 (26)	10.8 (17)	10.5 (9)		8.1 (55)	8.0 (30)	8.3 (25)	
North	10.1 (8)	4.1 (2)	20.0 (6)		8.7 (50)	8.9 (29)	8.4 (21)		10.2 (25)	10.1 (15)	10.5 (9)		9.5 (64)	9.0 (34)	10.0 (30)	

¹ Pearson chi-square test; ² Fisher exact test

Safety of CAM

Most of the respondents (95%) used CAM without experiencing adverse effects of the treatment. Five percent (n=34), however reported a total of 42 adverse effects. Four of the respondents (n=4) experienced adverse effects after consultations with CAM providers; 2 from acupuncture, 1 from traditional healing and 1 from cupping.

Twenty-one (n=21) respondents reported 27 adverse effects from natural remedies and dietary supplements; 4 from garlic, 4 from iron, 4 from Omega 3,6 or 9, 2 from protein shake, 2 from magnesium, 2 from ginger, 2 from high doses of vitamin C, 2 from zinc, 1 from vitamin D, 1 from vitamin B, 1 from herbal tea, 1 from lemon, and 1 from calcium.

Finally, eleven (n=11) respondents report 11 adverse effects from self-help practices: 9 from yoga, 1 from meditation, and 1 from relaxation (table 6). In 32 of the 42 cases (76.2%) adverse effects were reported even though the respondents found the modalities to be very or somewhat beneficial (table 6).

Table 6. Safety and perceived utility reported by respondents

Modalities	Number of adverse effects reported (n=42)	Perceived utility
Modalities received from CAM providers	4	
Acupuncture	1	Very beneficial
Acupuncture	1	Not beneficial
Traditional healing	1	Not beneficial
Cupping	1	Not beneficial
Natural remedies and dietary supplements	27	
Garlic	3	Very beneficial
Garlic	1	Somewhat beneficial
Iron	3	Very beneficial
Iron	1	Somewhat beneficial
Omega 3, 6 or 9	1	Very beneficial
Omega 3, 6 or 9	1	Somewhat beneficial
Omega 3, 6 or 9	2	Don't know
Protein shake	1	Very beneficial
Protein shake	1	Somewhat beneficial
Magnesium	1	Very beneficial
Magnesium	1	Somewhat beneficial
Ginger	1	Very beneficial
Ginger	1	Somewhat beneficial
High doses vitamin C	1	Very beneficial
High doses vitamin C	1	Don't know
Zink	1	Very beneficial
Zink	1	Don't know
Vitamin D	1	Somewhat beneficial
Vitamin B	1	Somewhat beneficial
Herbal tea	1	Very beneficial
Lemon	1	Very beneficial
Calcium tablets	1	Don't know
Self-help practices	11	
Yoga	4	Very beneficial
Yoga	4	Somewhat beneficial
Yoga	1	Not beneficial
Meditation	1	Very beneficial
Relaxation	1	Very beneficial

Discussion

The current study suggests that two out of three Norwegians (67.2%) used CAM during the first three months of the COVID-19 pandemic. This is 5% higher than the overall CAM use (62.2 %) reported in a similar population one year earlier [11]. In particular, it appeared that the use of natural remedies and dietary supplements had increased during the COVID-19 pandemic compared to the year before (57.0% versus 47.4%, respectively) [11]. These findings are in line with a recently published study from Poland demonstrating increased consumption of dietary supplements like vitamins C and D, zinc, and omega-3 during the first wave of the COVID-19 pandemic [15]. In this Polish study, 13% of respondents started supplementation during the pandemic because they wanted to improve the immunity and/or to be protected against COVID-19 (13%)[15]. In contrast to these findings, we found that a small proportion (1.5%) of people living in Norway used natural remedies, vitamins, minerals and dietary supplements to prevent or treat COVID-19. Therefore, the observed 10% increase in supplementation in the current study cannot solely be explained by the fact that more people in Norway were using supplements to specifically prevent or treat COVID-19. Rather, this increased usage seems to be an expression of a wish to actively

contribute to increased general well-being, to boost immunity and/or activate health-promoting pathways [12]. While supplementation increased, it became apparent that self-help practices (24.2% versus 29.1%) and CAM received from providers (7.8% versus 14.2%) had decreased compared to the year before [11]. This decrease in self-help practices and consultations with CAM provider is most likely caused by restricted access to fitness/yoga centers during the nationwide lockdown, and to the fact that CAM providers had to close down their clinics [4]. Altogether, it seems that the overall need of CAM use among Norwegian citizens has not profoundly changed by the COVID-19 pandemic. However, a shift has occurred in the type of CAM modalities used which may signify a willingness to actively participate and contribute to one's health and wellness. If one CAM modality is not accessible, people may just choose another one.

Even though consultations with CAM providers decreased by almost 50% during the first wave of the COVID-19 lockdown [11], 7.8% of the respondents still appeared to have had consulted CAM providers during the lockdown, with good perceived effect and low risk. This finding indicates that some CAM providers managed to reorganize their practice to non-physical consultations (online/telephone consultations) [4]. Likewise, regarding the use of self-help practices, although decreased, almost a quarter of Norwegian citizens continued to use these techniques during the lockdown. Previous research has shown that practicing yoga may lower depression, anxiety, and stress, and increase general wellbeing and peace of mind during the COVID-19 lockdown [16]. Furthermore, it has been reported that mindfulness may increase well-being and provides a tool for people to deal with stressful situations such as the COVID-19 pandemic [17].

A total of 5% of the respondents reported adverse effects of the treatment. As the respondents who reported adverse effects (n=42) mostly found CAM beneficial (n=32), the adverse effects found in this study might have been minor and transient [18]. In addition, many patients who use CAM believe that healing crisis (you get worse before getting better) is a part of the healing process [19]. This together may also be part of the explanation why reported adverse effects from natural remedies are generally low [20]. According to Deng et al [21], patients who use CAM must make a judgement of risk versus benefit of a modality. If a CAM modality have solid evidence of effect together with low risk profile, the more likely it is that patients will use the modality. On the other hand, if the risk profile (adverse effects) is greater than the beneficial effect, then it is less likely that patients will use it. The patient must weigh the beneficial effect against risk of the modality continuously and that is what the respondents in our study seems to have done.

The current study reported that women used CAM significantly more than men. These findings are in line with previous studies on CAM use in Norway [11, 22] and other studies in European countries unequivocally demonstrating that CAM use is more common in women [23-27].

Limitation

The main findings should be interpreted in light of the strengths and limitations of this study. A strength was the fact that the survey was conducted in a week's time and within a crucial, lockdown period during

the first wave of the COVID-19 pandemic in Norway. Another strength was that a similar study was conducted in the same population one year before the outbreak of the pandemic [11]. However, the observed differences between CAM use during the first wave of the pandemic and the year before should be interpreted with the knowledge that the studies used different time frame of CAM use. In the current study CAM use within the last three months was reported, whereas this was 12 months in the study conducted one year previously [11]. This might have influenced the lower number of respondents reporting consultations with CAM providers and use of self-help practices in the current study. Another limitation of the study is that the type of adverse effects is not known. We do not know if they were mild, moderate or severe, or if it was direct or indirect adverse effects [28]. The main limitation of this study was the rather low response rate of 34.5% that might influence the generalizability of the findings. On the other hand, the fact that the sample used was stratified by sex, age and region of residence increases the representativeness of the target population. The validity of self-reported data with a recall of three months can also be questioned, though the agreement between self-reported data and registered data is generally high [29].

Implication of the findings

Despite few reports of adverse effects from natural remedies and dietary supplements, the increased use of these modalities under the COVID-19 pandemic poses further challenges regarding safe use. Encouraged by social media and online marketing, people often buy natural remedies and dietary supplements online and use them without interference of a healthcare professional [30]. Main safety concerns regarding self-use of natural remedies and dietary supplements are their quality, possible interactions with other drug-related treatments [31, 32], and contamination with toxic compounds [33]. National strategies to identify, monitor, and reduce the occurrence of adverse events associated with self-use of CAM are therefore warranted. These strategies may include the development of an online registry system for the reporting of adverse events associated with CAM use in Norway [34], and to educate and inform consumers, patients and healthcare professionals about the potential risks associated with natural remedies and dietary supplements.

It remains to be investigated whether the observed shift toward increased use of natural remedies and dietary supplements during the first wave is maintained under the whole period of the COVID-19 pandemic. The extent to which these CAM modalities may support in the prevention of COVID-19 also remains to be investigated. A first observational study has demonstrated that supplementation with probiotics, omega-3 fatty acid, multivitamin or vitamin D supplements is modest but significantly associated with a lower risk of testing positive for SARS-CoV-2 in women, but not in men [35]. However, controlled high quality studies are needed in order to confirm these results.

Conclusion

The first wave of the COVID-19 pandemic has not profoundly changed the overall need of Norwegian citizens to seek care outside the conventional healthcare system, but rather caused a shift in the type of

CAM modalities used. The risk profile of these modalities was generally low as only 5 % of the respondents reported adverse effects. Further studies are needed to confirm the change from provider based to self-administered CAM use.

Abbreviations

COVID-19: Coronavirus Disease 2019

CAM: Complementary and Alternative Medicine

I-CAM-Q: International Questionnaire to measure use of Complementary and Alternative Medicine

Declarations

Ethics approval and consent to participate

Approval was applied for at the Regional Committee for Medical and Health Research Ethics (REK 2020/133217). They concluded that the project did not fall under the definition of projects to be assessed under the Health Research Act and therefore did not need approval. Informed consent to participate was obtained from all respondents.

Consent for publication

Not applicable

Availability of data and materials

The dataset this paper has been based on has not been deposited in any repository. All dataset and materials are available from the corresponding author upon reasonable request.

Competing interests

The first author Agnete Egilsdatter Kristoffersen is a member of the editorial board (Associate Editor) of BMC Complementary Medicine and Therapies

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Authors' contributions

AEK and TS conceived the study and all authors compiled the questionnaire. AEK performed the initial and final analyses. AEK and TS draft the initial version of the paper and all authors reviewed subsequent versions and read and approved the final manuscript.

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Figures

Figure 1

Flowchart of the respondents in the survey